First Pig-to-Human Liver Transplant Performed in China

A transplanted section of pig liver sucessfully supported a man's metabolic functions for more than a month.

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Surgeons in China have for the first time transplanted part of a genetically modified pig liver into a person who had advanced liver cancer and cirrhosis, Scientific American reports.

The transplanted section of the pig organ successfully supported the person's metabolic functions for 38 days. He lived another 133 days and died of gastrointestinal bleeding unrelated to the transplant, according to research published in the Journal of Hepatology.

Xenotransplantation is the transplantation of organs or tissues from one species to another. In recent years, scientists have made great strides in xenotransplantation, primarily involving pig organs.

The pig liver transplant "demonstrates that xenogeneic organs can not only survive short term but also perform physiological functions in the complex environment of a living body," study author Beicheng Sun, MD, PhD, president of the First Affiliated Hospital of Anhui Medical University in China, told Scientific American.

The patient involved was at risk of liver rupture caused by a tumor on one side of the liver, and the other side of the organ could not sustain life. Sun and his team implanted a section of the genetically modified pig liver as an "auxiliary" graft, a method that avoids removing all of the patient's native liver.

Immediately after the surgery, the pig liver began functioning. This allowed the man's liver to regenerate while the pig organ temporarily supported his metabolism. What's more, the pig liver "provided critical support to the patient, stabilizing his vital signs," according to Sun.

This “creates a bridge to give a patient more time” to recover or to receive a donor organ in case their liver must be completely replaced, according to Sun.

During the second month posttransplant, the patient developed a dangerous clotting disorder linked to immune activation known as thrombotic microangiopathy. The man was treated, but the condition worsened. On day 38, the team removed the pig liver.

Those 38 days allowed the man’s native liver to recover and regenerate enough to perform sufficiently for more than three months after the pig liver was removed. On day 171, he died of gastrointestinal bleeding unrelated to the transplant itself, according to researchers.

“The pig liver was not a substitute but a bridge to support the human liver,” Muhammad Mohiuddin, a surgeon at the University of Maryland and president of the International Xenotransplantation Association, told Scientific American. He was not involved in the experiment.

While the xenotransplantation could be considered successful, more studies are required to confirm that the pig liver aided in the regeneration of the human liver.

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